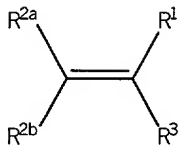
WE CLAIM:

1. A copolymer prepared by copolymerization of a first monomer having the structure of formula (I)

(I) 

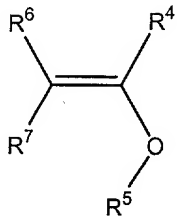
wherein

R^1 is H, F, CN, CH_3, CF_3, CF_2H, or CFH_2;

R^{2a} and R^{2b} are independently H or F; and

R^3 is CN or COOR, wherein R is selected from the group consisting of H, C_{1-12} alkyl and C_{1-12} fluoroalkyl, or is selected so as to render R^3 acid-cleavable; and

a second monomer having the structure of formula (II)

(II) 

wherein

R^4 is H, C_{1-12} alkyl, or C_{3-15} alicyclic,

R^5 is C_{1-12} alkyl, C_{1-12} alkyl substituted with 1-12 fluorine atoms and 0-2 hydroxyl groups, or C_{3-15} alicyclic, or R^4 and R^5 together form a five-, six-, or seven-membered ring,

R^6 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^4 and R^6 together form a five-, six-, or seven-membered ring, and

R^7 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^7 and R^5 together represent -X-$(CR^8R^9)_n$-, in which case R^4 and R^6 are H, X is O or CH_2, n is 1 or 2, R^8 and R^9 are H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or together form an oxo moiety (=O), with the proviso that when R^8 and R^9 together form =O, n is 1.

2. The copolymer of Claim 1, wherein R^1 is CF_3.

3. The copolymer of Claim 2, wherein R^3 is COOR.

4. The copolymer of Claim 2, wherein R^3 is CN.

5. The copolymer of Claim 1, wherein R^1 and R^2 are F and R^3 is COOR.

6. The copolymer of Claim 1, wherein R^1 is CN and R^2 is H.

7. The copolymer of Claim 3, wherein R is C_{1-12} alkyl.

8. The copolymer of Claim 5, wherein R is C_{1-12} alkyl.

9. The copolymer of Claim 3, wherein R is selected to render R^3 acid-cleavable.

10. The copolymer of Claim 5, wherein R is selected to render R^3 acid-cleavable.

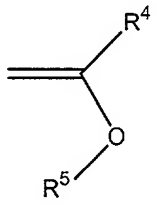
11. The copolymer of Claim 10, wherein R is a tertiary alkyl substituent.

12. The copolymer of Claim 11, wherein R is *t*-butyl.

13. The copolymer of Claim 11, wherein R is a C_5-C_{12} cyclic or alicyclic substituent with a tertiary attachment point.

14. The copolymer of Claim 13, wherein R is selected from the group consisting of 2-methyl-2-adamantyl, 2-methyl-2-isobornyl, 2-methyl-2-tetracyclododecenyl, 1-methylcyclopentyl, and 1-methylcyclohexyl.

15. The copolymer of Claim 1, wherein the second monomer has the structure of formula (III)

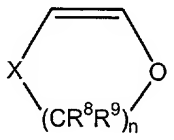
(III) 

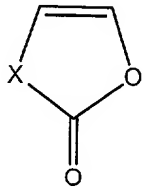
wherein

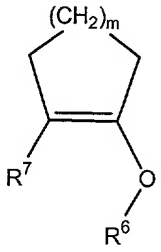
R^4 is H, C_{1-12} alkyl, or C_{3-15} alicyclic; and

R^5 is C_{1-12} alkyl, C_{1-12} alkyl substituted with 1-12 fluorine atoms and 0-2 hydroxyl groups, or C_{3-15} alicyclic.

16. The copolymer of Claim 1, wherein the second monomer has a structure selected from the group consisting of (IV), (V), and (VI)

(IV) 

(V) 

(VI) 

wherein

R^5 is C_{1-12} alkyl, C_{1-12} alkyl substituted with 1-12 fluorine atoms and 0-2 hydroxyl groups, or C_{3-15} alicyclic,

R^7 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl,

X is O or CH_2,

m is an integer between 1 and 3, and

R^8 and R^9 are H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl.

17. The copolymer of Claim 1, wherein the copolymer is substantially transparent to radiation having a wavelength of less than about 250 nm.

18. The copolymer of Claim 17, wherein the copolymer is substantially transparent to radiation having a wavelength of less than about 193 nm.

19. The copolymer of Claim 18, wherein the copolymer is substantially transparent to radiation having a wavelength of 157 nm.

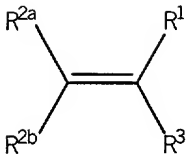
20. The copolymer of Claim 1, further comprising at least one additional monomer having a structure that is different that the first and second monomers.

21. A lithographic photoresist composition comprising the copolymer of Claim 1 and a radiation-sensitive acid generator.

22. The lithographic photoresist composition of Claim 18, further comprising a second polymer.

23. A process for generating a resist image on a substrate, comprising the steps of:

(a) coating a substrate with a film of a photoresist comprised of a radiation-sensitive acid generator and a copolymer synthesized from a first monomer having the structure of formula (I)

(I) 

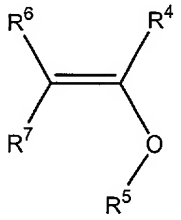
wherein

R^1 is H, F, CN, CH_3, CF_3, CF_2H, or CFH_2;

R^{2a} and R^{2b} are independently H or F; and

R^3 is CN or COOR, wherein R is selected from the group consisting of H, C_{1-12} alkyl and C_{1-12} fluoroalkyl, or is selected so as to render R^3 acid-cleavable, with the proviso that when R^3 is CN, then R^1 is CF_3 and R^{2a} and R^{2b} are H; and

a second monomer having the structure of formula (II)

(II) 

wherein

R^4 is H, C_{1-12} alkyl, or C_{3-15} alicyclic,

R^5 is C_{1-12} alkyl, C_{1-12} alkyl substituted with 1-12 fluorine atoms and 0-2 hydroxyl groups, or C_{3-15} alicyclic, or R^4 and R^5 together form a five-, six-, or seven-membered ring,

R^6 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^4 and R^6 together form a five-, six-, or seven-membered ring,

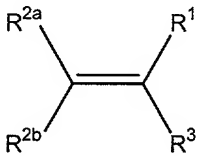
R^7 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^7 and R^5 together represent

-X-(CR^8R^9)$_n$-, in which case R^4 and R^6 are H, X is O or CH_2, n is 1 or 2, R^8 and R^9 are H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or together form an oxo moiety (=O), with the proviso that when R^8 and R^9 together form =O, n is 1

(b) exposing the film selectively to a predetermined pattern of radiation so as to form a latent, patterned image in the film; and

(c) developing the latent image with a developer.

24. In a lithographic photoresist composition comprised of a polymer transparent to deep ultraviolet radiation and a radiation-sensitive acid generator, the improvement comprising employing as the polymer a copolymer synthesized from a first monomer having the structure of formula (I)

(I) 

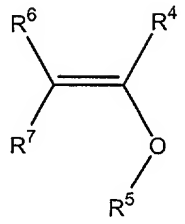
wherein

R^1 is H, F, CN, CH_3, CF_3, CF_2H, or CFH_2;

R^{2a} and R^{2b} are independently H or F; and

R^3 is CN or COOR, wherein R is selected from the group consisting of H, C_{1-12} alkyl and C_{1-12} fluoroalkyl, or is selected so as to render R^3 acid-cleavable, with the proviso that when R^3 is CN, then R^1 is CF_3 and R^2 is H; and

a second monomer having the structure of formula (II)

(II) 

wherein

R^4 is H, C_{1-12} alkyl, or C_{3-15} alicyclic,

R^5 is C_{1-12} alkyl, C_{1-12} alkyl substituted with 1-12 fluorine atoms and 0-2 hydroxyl groups, or C_{3-15} alicyclic, or R^4 and R^5 together form a five-, six-, or seven-membered ring,

R^6 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^4 and R^6 together form a five-, six-, or seven-membered ring;

R^7 is H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or R^7 and R^5 together represent -X-$(CR^8R^9)_n$-, in which case R^4 and R^6 are H, X is O or CH_2, n is 1 or 2, R^8 and R^9 are H, C_{1-12} alkyl, or C_{1-12} fluoroalkyl, or together form an oxo moiety (=O), with the proviso that when R^8 and R^9 together form =O, n is 1.

25. The lithographic photoresist composition of Claim 24, wherein the photoresist composition is a positive resist and further comprises a photoacid-cleavable monomeric or polymeric dissolution inhibitor.

26. The lithographic photoresist composition of Claim 24, wherein the photoresist composition is a negative resist and further comprises a crosslinking agent.

27. The lithographic photoresist composition of Claim 26, wherein the crosslinking agent is a glycoluril compound.

28. The lithographic photoresist composition of Claim 27, wherein the glycoluril compound is selected from the group consisting of tetramethoxymethyl glycoluril, methylpropyltetramethoxymethyl glycoluril, methylphenyltetramethoxymethyl glycoluril, and mixtures thereof.